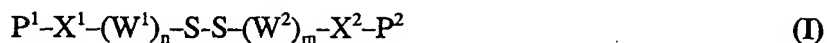


WHAT IS CLAIMED IS:

1 1. A compound having the formula:



3 wherein

4 P¹ and P² are each members independently selected from the group consisting of a
5 hydrogen atom, an activating group and a protecting group;

6 X¹ and X² are each independently selected from the group consisting of a bond, -O-,
7 -NH-, -NR- and -CO₂-, wherein R is a lower alkyl group having one to four
8 carbon atoms;

9 W¹ and W² are each independently selected from the group consisting of methylene,
10 oxyethylene and oxypropylene; and

11 n and m are each independently integers of from 2 to 12 with the proviso that n and
12 m are not the same when W¹ and W² are the same, and with the further
 proviso that P¹ and P² are not both hydrogen atoms.

1 2. A compound in accordance with claim 1, wherein P² is an activating group
2 selected from the group consisting of a phosphoramidite, a trialkylammonium H-
 phosphonate and a phosphate triester.

1 3. A compound in accordance with claim 1, wherein P² is a phosphoramidite,
2 P¹ is a protecting group selected from the group consisting of acid labile protecting groups,
3 W¹ and W² are both methylene, X¹ and X² are both -O-, and n and m are each integers of
 from 2 to 8.

1 4. A compound in accordance with claim 1, wherein P² is a phosphoramidite,
2 P¹ is DMT, W¹ and W² are both methylene, X¹ and X² are both -O-, and n and m are each
 integers of from 3 to 8.

1 5. A modified substrate for use in solid phase chemical synthesis, said substrate
2 having the formula:



wherein A¹ is a solid support, B¹ is a bond or a ^{Spacer}derivatizing group, and L¹ is a linking group having the formula:



wherein,

P¹ is a protecting group;

X¹ and X² are each independently selected from the group consisting of a bond, -O-, -NH-, -NR- and -CO₂-, wherein R is a lower alkyl group having one to four carbon atoms;

W¹ and W² are each independently selected from the group consisting of methylene, oxyethylene and oxypropylene; and

n and m are each independently integers of from 2 to 12 with the proviso that n and m are not the same when W¹ and W² are the same.

6. A substrate in accordance with claim 5, wherein P¹ is a photolabile protecting group.

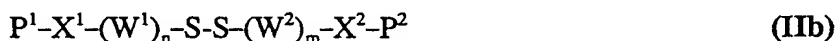
7. A substrate in accordance with claim 5, wherein P¹ is a photolabile protecting group, W¹ and W² are both methylene, and X¹ and X² are both -O-.

8. A substrate in accordance with claim 5, wherein P¹ is a photolabile protecting group, X¹ and X² are both -O-, and n and m are each integers of from 2 to 8.

9. A substrate in accordance with claim 5, wherein P¹ is DMT, X¹ and X² are both -O-, W¹ and W² are both methylene, and n and m are each integers of from 2 to 8.

10. A method of synthesizing small ligand molecules on a solid support having optional spacers, said small ligand molecules being removable therefrom upon treatment with a suitable disulfide cleaving reagent, said method comprising:

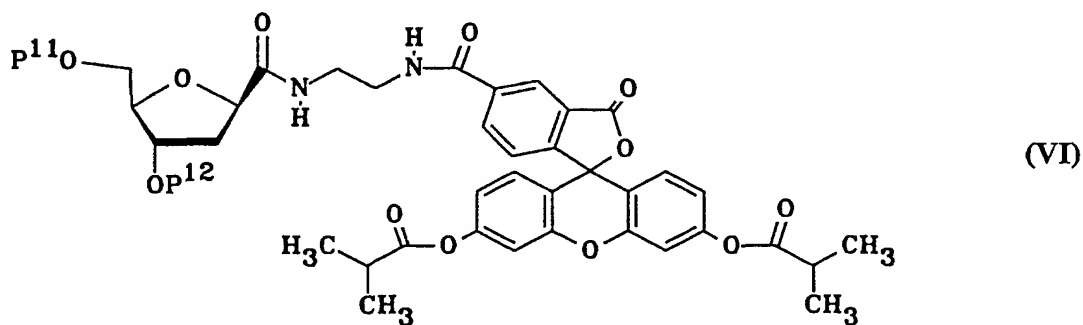
(a) contacting a solid support an unsymmetrical disulfide linking group of formula:



wherein,

7 P^1 and P^2 are each members independently selected from the group consisting of a
 8 hydrogen atom, an activating group and a protecting group;
 9 X^1 and X^2 are each independently selected from the group consisting of a bond, $-O-$,
 10 $-NH-$, $-NR-$ and $-CO_2-$, wherein R is a lower alkyl group having one to four
 11 carbon atoms;
 12 W^1 and W^2 are each independently selected from the group consisting of methylene,
 13 oxyethylene and oxypropylene; and
 14 n and m are each independently integers of from 2 to 12 with the proviso that n and
 15 m are not the same when W^1 and W^2 are the same;
 16 to produce a derivatized solid support having attached unsymmetrical disulfide linking
 17 groups suitably protected with protecting groups;
 18 (b) optionally removing said protecting groups from said derivatized solid support to
 19 provide a derivatized solid support having unsymmetrical disulfide linking groups with
 20 synthesis initiation sites; and
 21 (c) coupling said small ligand molecules to said synthesis initiation sites on said
 22 derivatized solid support to produce a solid support having attached small ligand molecules
 which are removable therefrom upon application of said disulfide cleaving reagent.

1 11. A compound of the formula:



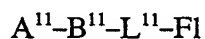
3 wherein P^{11} and P^{12} are each independently selected from the group consisting of hydrogen,
 a protecting group, and a phosphodiester-forming group.

12. A compound in accordance with claim 11, wherein P¹¹ and P¹² are both hydrogen.

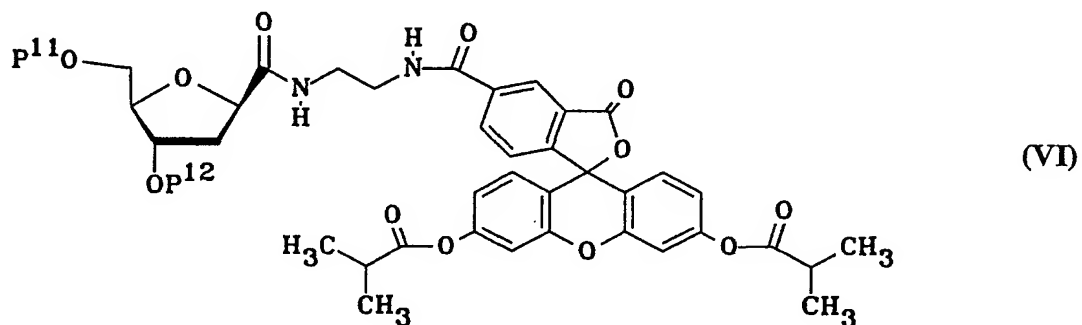
13. A compound in accordance with claim 11, wherein P¹¹ is a protecting group and P¹² is a phosphoramidite.

14. A compound in accordance with claim 11, wherein P¹¹ is DMT and P¹² is a phosphoramidite.

15. A substrate for the solid phase synthesis of oligonucleotides, said substrate having the formula:



wherein A¹¹ is a solid support, B¹¹ is a bond or a derivatizing group, L¹¹ is a linking group, and Fl is a fluorescent moiety having the formula:



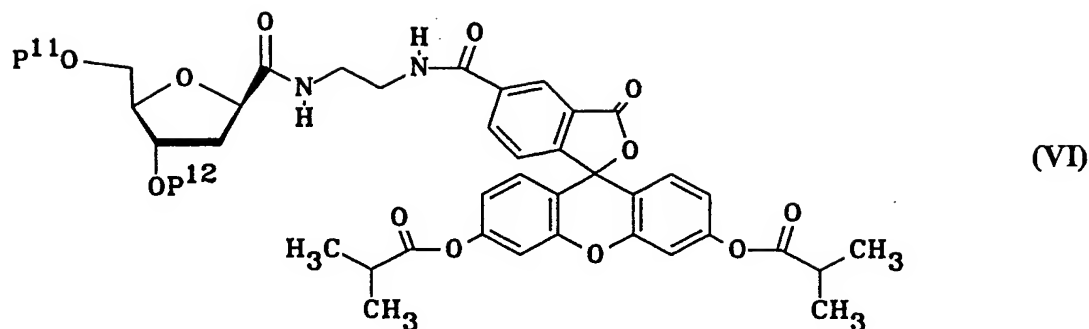
wherein one of P¹¹ and P¹² is a covalent bond to L¹¹ and the other of P¹¹ and P¹² is selected from the group consisting of hydrogen, a protecting group, and a phosphoramidite.

16. A substrate bound, fluorescently labeled oligonucleotide having the formula:



wherein A¹¹ is a solid support, B¹¹ is a bond or a derivatizing group, L¹¹ is a linking group, Nu is an oligonucleotide and Fl is a fluorescent moiety having the formula:

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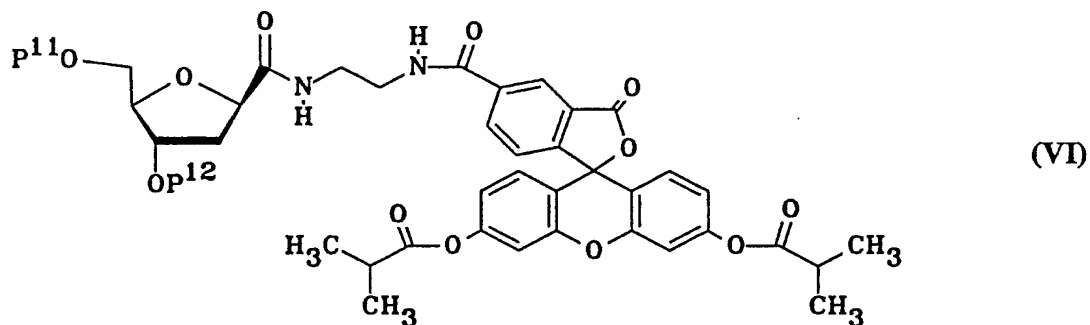


6 wherein one of P¹¹ and P¹² is a covalent bond to L¹¹ and the other of P¹¹ and P¹² is selected from the group consisting of hydrogen, a protecting group, and a phosphoramidite.

1 17. A substrate bound, fluorescently labeled oligonucleotide having the formula:



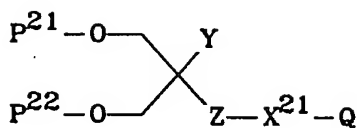
3 wherein A¹¹ is a solid support, B¹¹ is a bond or a derivatizing group, L¹¹ is a linking group,
4 Fl is a fluorescent moiety having the formula:



6 wherein each of P¹¹ and P¹² represents a bond; and
Nu is an oligonucleotide.

1 18. A selectively cleavable linkage molecule useful in solid phase compound
2 synthesis, said linkage molecule having the formula:

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wherein

P^{21} and P^{22} are each protecting groups with the provisos that P^{21} can be removed under conditions which will not remove P^{22} , and P^{22} can be removed under conditions which will not remove P^{21} ;

X^{21} is a linking moiety selected from the group consisting of an alkylene chain and an aryl group;

Y is a substituent selected from the group consisting of $-\text{C}(=\text{O})\text{R}$, $-\text{S}(\text{O})\text{R}$, $-\text{S}(\text{O})_2\text{R}$, $-\text{S}(\text{O})_2\text{NRR}'$, $-\text{CN}$, $-\text{CF}_3$, $-\text{NO}_2$ and a phenyl ring having one or more substituents selected from the group consisting of halogen, nitro, cyano and trifluoromethyl;

Z is a linking moiety selected from the group consisting of $-\text{C}(=\text{O})-$, $-\text{S}(\text{O})-$, $-\text{S}(\text{O})_2-$, $-\text{S}(\text{O})_2\text{NR}-$,

wherein

R and R' are each independently selected from the group consisting of hydrogen, $\text{C}_1\text{-C}_{12}$ alkyl and aryl; and

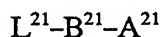
Q is a phosphate ester-forming group selected from the group consisting of a phosphoramidite and a trialkylammonium H-phosphonate.

19. A selectively cleavable linkage molecule in accordance with claim 18, wherein X^{21} is an amino alkoxy group, Y is $-\text{C}(=\text{O})\text{R}$, Z is $-\text{C}(\text{O})-$ and Q is a phosphoramidite.

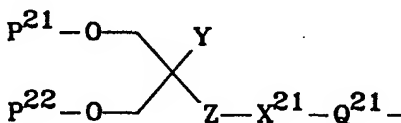
20. A selectively cleavable linkage molecule in accordance with claim 18, wherein P^{21} is removable under photolytic conditions, P^{22} is removable under acidic conditions, X^{21} is an amino alkoxy group, Y is $-\text{C}(=\text{O})\text{R}$, Z is $-\text{C}(\text{O})-$ and Q is a phosphoramidite.

21. A selectively cleavable linkage molecule in accordance with claim 18,
 wherein P^{21} is MeNPOC, P^{22} is DMT, X^{21} is $-\text{NH}-\text{CH}_2\text{CH}(\text{CH}_3)-\text{O}-$, Y is $-\text{C}(=\text{O})\text{R}$, Z is $-\text{C}(\text{O})-$ and Q is a phosphoramidite.

22. A modified substrate for use in solid phase chemical synthesis, said substrate
 having the formula:



wherein A^{21} is a solid support, B^{21} is a bond or a derivatizing group, and L^{21} is a linking
 group having the formula:



wherein

P^{21} and P^{22} are each protecting groups with the provisos that P^{21} can be removed
 under conditions which will not remove P^{22} , and P^{22} can be removed under
 conditions which will not remove P^{21} ;

X^{21} is a linking moiety selected from the group consisting of an alkylene chain and an
 aryl group;

Y is a substituent selected from the group consisting of $-\text{C}(=\text{O})\text{R}$, $-\text{S}(\text{O})\text{R}$, $-\text{S}(\text{O})_2\text{R}$,
 $-\text{S}(\text{O})_2\text{NRR}'$, $-\text{CN}$, $-\text{CF}_3$, $-\text{NO}_2$ and a phenyl ring having one or more
 substituents selected from the group consisting of halogen, nitro, cyano and
 trifluoromethyl;

Z is a linking moiety selected from the group consisting of $-\text{C}(=\text{O})-$, $-\text{S}(\text{O})-$,
 $-\text{S}(\text{O})_2-$, $-\text{S}(\text{O})_2\text{NR}-$,

wherein

R and R' are each independently selected from the group consisting of
 hydrogen, C_1 - C_{12} alkyl and aryl; and

Q^{21} is a phosphate ester linking group.